

## **REMARKS**

Claims 1-33 remain in this application. Claims 26-33 have been withdrawn as non-elected. Independent claim 1 and dependent claims 10, 11, 13, 15 and 16 have been amended to more clearly define the subject matter which Applicants regard as their inventive concepts, and claims 8, 9, 12 and 34 are hereby cancelled without prejudice. Reconsideration of the application in view of the amendments to the claims and the remarks which follow is respectfully requested.

### **Claim rejections - 35 U.S.C. § 112**

The rejection to claim 34 under 35 U.S.C. § 112, second paragraph, as being indefinite has been rendered moot since claim 34 has been canceled. Withdrawal of the rejection is requested.

### **Claim rejections - 35 U.S.C. § 102(b)**

The rejection of claims 1-5, 8-10, 12-13, 18, and 20 (now 1-5, 8-9, 12-13 and 18) under 35 U.S.C. § 102(b) as anticipated by Horvath et al. (US 3,876,749) is respectfully traversed, particularly in view of the amendment to claim 1. The “*reducing agent*” is now defined as “*molten cast iron*”, and the “*alkali*” is now defined as “*a carbonate*”.

The term “*cast iron*” refers to a large group of ferrous alloys which solidify with a eutectic and in which carbon and silicon are the alloying elements present in the range of from 2.1 wt% to 4 wt% and 1 wt% to 3 wt%, respectively. Iron alloys with less carbon are known as steel. Cast iron is often identified further by reference to the color of its fractured surface, namely *white cast iron* and *grey cast iron*.

Thus, Applicants’ use of the word “*cast*” in the term “*molten cast iron*” is a limitation in the compositional characteristics of the “*reducing agent*” with which the titaniferrous or aluminaferrous mixture is smelted in step (A) of the claim defined process. The Examiner’s suggestion (page 5, lines 2-3) that the limitation constitutes “*a process of making a molten iron bath by casting*” (i.e., that “*cast*” is a product-by-process limitation on a “*molten iron bath*”) is unfounded. A molten cast iron bath is clearly made by melting cast iron, not by casting molten iron. Example 1, line 2, in Applicants’ specification describes how grey cast iron acting as a reducing agent was melted in an induction furnace.

The advantage of using molten cast iron, expressed at the foot of page 4 of the specification, is that the inherent carbon and silicon content serves to produce a molten slag with high carbon content steel. This may be done without increasing the need for additional energy consumption because reactions 1 and 2 at the foot of page 4 and the combustion of evolved CO are exothermic. The melting temperature of the high carbon steel is readily maintained at around 1475°C.

For a prior art reference to be anticipatory, MPEP §2131 provides that: "A claim is anticipated only if each and every element set forth in the claim is found, either expressly or inherently described in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628 (Fed. Cir. 1987). Further, the reference has to describe each and every element recited in the claim in as complete detail as is contained in the claim and arranged as recited in the claim. ("The identical invention must be shown in as complete detail as contained in the ....claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226 (Fed. Cir. 1989)).

While Horvath et al. may suggest smelting a titaniferrous or aluminaferrous mixture in the presence of a "reducing agent", it does not describe or suggest whatsoever the use of cast iron as a reducing agent in a process for recovering at least one metal oxide from such a mixture. In fact, the only reducing agent referred to by Horvath et al. is anthracite. Accordingly, Horvath et al. cannot be construed as anticipating the instant claims because it does not describe or suggest the use of cast iron as a reducing agent. Reconsideration and withdrawal of the rejection is respectfully requested.

#### **Claim rejections - 35 U.S.C. 103(a)**

The rejection of claims 11 and 19 under 35 U.S.C. § 102(a) as being unpatentable over Horvath et al. (US 3,876,749) is respectfully traversed. Applicants hereby confirm that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made.

As discussed above in connection with the rejection under 35 U.S.C. § 102(b), Horvath et al. cannot be construed to teach the method of Applicants' claim 9 because it does not describe or suggest the use of cast iron as a reducing agent. Horvath et al.'s teaching as to recovery of steel from molten red mud by adding a reducing agent and

burnt lime would not be expected to produce metallic iron that is 0.8 to 1.0% C steel. It also follows that Applicants' claim 19 cannot be rendered obvious in view of Horvath et al. because Horvath et al. does not teach Applicants' claim 18 for the reasons set forth above, and, as noted by the Examiner, Horvath et al. does not teach "during tapping of the residual slag, alkali is added by dosing." Reconsideration and withdrawal of the rejection is respectfully requested.

#### **Claim rejections - 35 U.S.C. 103(a)**

The rejection of claims 1, 6-7, 11, 14-17, 19-25 and 34 (now claims 1, 6-7, 11, 15-17 and 19-25) are rejected under 35 U.S.C. 103(a) as being unpatentable over Horvath et al. (US 3,876,749) in view of Jha (WO 02/10068) is respectfully traversed.

As explained in detail in connection with the rejection of the claims under 35 U.S.C. § 102(b), Horvath et al. does not describe or suggest the use of cast iron as a reducing agent. The only reducing agent referred to by Horvath et al. is anthracite, and that teaching cannot be extended by implication or otherwise to include anything but anthracite because the reference is completely silent in that regard. Jha, however, cannot properly be combined with Horvath et al. to render the subject matter of Applicants' claims obvious because Jha does not relate to reductive smelting. Jha describes *oxidative roasting* which does not require a reducing agent. Thus, it is respectfully submitted that the subject matter of newly amended claim 1, and all of the claims which depend therefrom, is novel and non-obvious over Horvath et al. in view of Jha. Reconsideration and withdrawal of the rejection is respectfully requested.

### **CONCLUSION**

It is believed that the foregoing Amendment and remarks constitute a complete response to the Examiner's Action mailed January 4, 2011, and place this application in condition for allowance. Should the Examiner believe that an interview or other action on Applicants' behalf would expedite prosecution of the application, he is urged to contact Applicants' attorney by telephone.

Respectfully submitted,

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